

A Dual Perspective on Academic Advising: Challenges Faced by Community College Transfers and Faculty Advisors in Engineering

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This study provides a deeper understanding of the challenges facing community college transfer students in engineering and their faculty advisors at a 4-year research university. Using a phenomenological approach, data was analyzed from interviews with nine engineering transfers and seven faculty advisors. The findings unveiled nuanced barriers faced by engineering transfers and their faculty advisors, including transfers' academic unpreparedness and struggles with nonacademic responsibilities; advisors' heavy workload, disconnection with other student services, and lack of communication with community college advisors; and restrictions on course selection and program requirements in 4-year engineering programs. The findings provide meaningful insights into developing new policies and practices to improve the academic advising experience for engineering transfers.

[doi:10.12930/NACADA-22-26]

KEY WORDS: Community college, transfer students, engineering, academic advising

The community college transfer pathway broadens participation and enhances racial/ethnic diversity in science, technology, engineering, and mathematics (STEM) fields (National Research Council & National Academy of Engineering, 2012). Serving a highly diverse student population, community colleges make earning a STEM degree possible for many students who are otherwise unable to afford higher education (Hagedorn & Purnamasari, 2012). According to the most recent Science and Engineering (S&E) Indicators (National Science Board, 2020), between 2010 and 2017, 47% of U.S. S&E baccalaureate degree recipients took courses at community colleges, and 18% received an associate degree. Despite community colleges serving as a viable pathway to STEM degrees and careers, transfer students, who choose community colleges as a stepping-stone to obtaining a baccalaureate degree, often encounter more challenges than their peers who begin higher education directly at 4-year universities (see Lakin & Elliott, 2016; Packard et al., 2012; Zhang & Allen, 2015). Consequently, community college transfer students have a

higher risk of switching to non-STEM majors (National Academies of Sciences, Engineering, and Medicine, 2016) and a lower probability of earning a STEM degree (Wang, 2015).

As researchers and policymakers seek to identify strategies to improve the community college pathway to STEM degree attainment, academic advising becomes a vital component of the national discussion. Academic advising has long been pivotal to support college students' academic performance, retention, and graduation (Hunter & White, 2004; Smith et al., 2009; Young-Jones et al., 2013). The importance of academic advising is magnified for aspiring engineering transfer students, as they are challenged by the transfer process and rigorous discipline requirements. The highly sequential curriculum requires engineering majors to rely heavily on advisors to change course schedules, take classes in a proper sequence, and obtain information regarding internship and graduation (Cogdell, 1995; Sutton & Sankar, 2011; Varma & Hahn, 2007). Researchers also noted the importance of academic advising for underrepresented minorities: women, older learners, students of color, and economically disadvantaged students (Smith & Allen, 2006).

To ensure all engineering transfer students make full use of academic advising, an essential first step is identifying barriers. Without a thorough examination of the obstacles, it would be impossible to develop strategies to improve engineering transfers' advising experience. Therefore, this study aimed to explore the obstacles that engineering transfer students and their faculty advisors encountered at a 4-year university. To provide a more holistic view, this study focused on a dual perspective of transfer students and faculty advisors in 4-year engineering programs. The guiding research question was "How do community college transfer students and academic advisors describe challenges they encounter in 4-year engineering programs?"

Literature Review

I reviewed literature primarily focusing on the post-transfer experience of community college students in 4-year engineering programs. A large body of literature explores the 4-year university

students' experience; research specific to transfer students in engineering programs is fragmented. Therefore, I expanded my review to the literature on community college transfers and nontransfers pursuing engineering in 4-year universities.

Experiences of Community College Transfer Students

A rich body of literature has explored community college transfer students' experiences at 4-year universities and the unique obstacles they often experience: poor academic preparation, a decrease in grade point average (GPA), social and psychological stress, transfer stigma, and difficulties in socialization and integration (see Berger & Malaney, 2003; Chrystal et al., 2013; Gard et al., 2012; Hills, 1965; Ishitani & McKittrick, 2010; Laanan et al., 2010; Townsend & Wilson, 2006). Financial constraints and the need to work long hours to address limited financial resources also created obstacles for transfer students (Packard et al., 2012).

However, most of the research does not specify transfer students' disciplines. Only a handful of studies focus on vertical transfers pursuing engineering degrees (see Allen & Zhang, 2016; Ogilvie & Knight, 2019, 2020, 2021; Sullivan et al., 2012). Compared to transfer students in other disciplines, engineering transfer students seem to face more obstacles at 4-year universities. This is primarily from higher academic rigor and more rigid requirements in engineering programs (Zhang & Allen, 2015). The feeling of being underprepared for this academic rigor would divert transfer students from engineering programs (Meyer & Marx, 2014). Additionally, as engineering requires a solid math foundation, transfer students experienced substantial difficulty navigating engineering studies without a strong math background (Bahr et al., 2017; Laugerman et al., 2015). Similar to transfer students in other disciplines, engineering transfers could be negatively impacted in adjustment and academic success if the knowledge and skills gained before enrolling in 4-year universities were stigmatized or underestimated by faculty members or institutional personnel (Ogilvie & Knight, 2019).

Challenges Facing Engineering Transfers in Academic Advising

In general, transfer students experience many challenges when seeking academic advising in 4-year universities. Access to academic advising is a major obstacle for transfer students because

of the high student-to-advisor ratio (Allen et al., 2013, 2014; Davies & Dickmann, 1998). In addition, transfer students may receive insufficient or inaccurate information from advisors in community colleges and 4-year universities, which could lead them to miss deadlines, take classes that are not transferable to their degree programs, or escalate frustration (Allen et al., 2014).

Another barrier for transfer students is the lack of individualized communication with advisors in both community college and 4-year contexts. Transfer students reported that they felt like "a number or another name on a list" and had to "reintroduce themselves and reiterate their educational goals" every time they visited an advisor (Allen et al., 2014, p. 363). Similarly, researchers noted transfer students' negative post-transfer experiences when the advisors paid inadequate attention to students' needs or made inappropriate comments (Davies & Dickmann, 1998).

Research on engineering students suggested comparable results. Khali and Williamson (2014) found that engineering students in a 4-year state university had limited access to academic advisors, which may result in student dissatisfaction with their academic programs and eventual departure from engineering. In Marra et al.'s (2012) multiple-year study, engineering students at a 4-year university failed to develop a personal relationship with their advisors, leading to their low cumulative GPA and departure from engineering programs. In a more recent study of first-generation vertical transfer students in engineering (Mobley & Brawner, 2019), almost all the participants encountered challenges in obtaining the advising service needed.

These students tended to rely on themselves to navigate the community college pathway to engineering baccalaureate degrees, regardless of access to advising (Mobley & Brawner, 2019).

Challenges Facing Academic Advisors

Although staff and faculty advisors may serve different roles, both encounter a broad spectrum of difficulties when advising community college transfer students in 4-year universities. For instance, Severance (1987) reported various barriers for academic advisors at 4-year universities; a lack of understanding of formal agreement on transfer policies (i.e., articulation agreements) between 2- and 4-year institutions; heavy advising workloads; and difficulties balancing advising and teaching responsibilities, research, and administrative work. This

study was conducted more than 3 decades ago, but the findings remain relevant. Percival et al. (2016) found in a college-to-university pathway program in Canada that miscommunication between 4-year advisors and their community colleges counterparts was a major challenge to effective academic advising. The advisors in the study expressed frustration about miscommunication regarding prerequisite and elective course requirements and the content discrepancy between courses taught at 2- and 4-year institutions (Percival et al., 2016).

The heavy workload has been recognized as a key barrier preventing faculty advisors from delivering individualized academic advising to their advisees in engineering (Khali & Williamson, 2014). Woolston (2002) revealed that the academic nature of engineering programs encourages faculty advisors to refer closely to a flowchart that contains information on prerequisites, electives, course numbers, and credits when guiding students. As a result, faculty advisors tend to present facts to students rather than opinions, which students often seek (Woolston, 2002). Zhang and Dinh (2017) found that many academic advisors in 4-year engineering programs did not receive sufficient training and support to serve students from internationally diverse backgrounds. The study also revealed that engineering advisors had sparse opportunities to collaborate with other professionals to satisfy the needs of international engineering students.

Collectively, research shows that engineering community college transfers encounter more challenges than their nontransfer counterparts or peers in other disciplines when navigating the 4-year university. However, a limited number of studies focus specifically on engineering transfer student advisement, and none has investigated challenges in academic advising from both perspectives of advisors and advisees.

Methods

Research Design

I adopted a qualitative phenomenological research design as it aims to understand “the essence of the experience for individuals incorporating ‘what’ they have experienced and ‘how’ they experienced it” (Creswell, 2013, p. 79). This design aimed to develop comprehensive descriptions of shared experiences in academic advising among engineering transfers and faculty advisors in a 4-year context. This study was conducted at a 4-year public research university in the southcentral region of the United States. The university

offers various comparative engineering programs in the College of Engineering (COE) that attract a large number of community college students.

I used purposeful sampling (Patton, 1990) to recruit students and faculty advisors who could provide in-depth information about their advising experiences in engineering. Approximately 2,000 students who studied previously at a community college and enrolled in COE in Fall 2017 were invited by email to participate in the study. Among those who responded to the invitation, I selected students who satisfied the following criteria: attended a community college immediately before their transfer to the university, enrolled in an engineering degree program upon their transfer, and had been studying in the same engineering program for at least one semester at the university. In total, nine transfer students (pseudonymized as Adam, Carlos, Clair, Frank, Harris, Larry, Luis, May, and Teo) participated. These transfers were from bioengineering, civil engineering, industrial engineering, mechanical engineering, and aerospace engineering. All participants transferred from a local community college, and none received an associate’s degree. Their ages ranged between 21 and 33; two were female; four were White, three Hispanic, one Asian, and one Black. All the participants worked in Fall 2017 between 10 and 35 hours per week on-campus, off-campus, or combined. When compared to the COE undergraduate student population, a similar pattern regarding race/ethnicity and gender distribution was observed.

I invited only faculty advisors to participate in this study because staff advisors mainly serve first-year students at the university, while most transfers were classified as sophomores or juniors with credits transferred from community colleges. Faculty advisors who worked less than one semester in COE were excluded because they may not have been fully exposed to the engineering context. Seven faculty advisors (pseudonymized as Drs. Marshall, Anderson, Gilbert, Roberts, Wilson, Hill, and Newman), representing a wide range of academic programs, including bioengineering, civil engineering, computer engineering, electrical engineering, mechanical engineering, and aerospace engineering, were interviewed. Among the advisors, two were professors (Drs. Anderson and Wilson) and five were senior lecturers; two were female (Drs. Marshall and Roberts); four were White, two Asian, and one Hispanic. The length of their service as faculty advisors varied from 2 years to more than a decade. Regardless of the

size of engineering programs, on average, the advisors served 200 to 400 advisees per semester, approximately half of whom were transfers.

Data were collected from semistructured, individual face-to-face interviews with transfer students in Fall 2017 and faculty advisors in Spring 2018. The interviews lasted approximately 40 minutes to 60 minutes. During the interviews, the advisees were asked to share their experiences with academic advisors and the challenges they encountered. Similarly, the advisors shared their experiences and challenges in advising engineering transfer students. The detailed interview protocols are included in Appendix A.

All the interviews were audio-recorded and transcribed verbatim. As soon as the interview transcripts were prepared, I reviewed them thoroughly for transcription accuracy. I applied the open coding technique to the transcripts (Esterberg, 2002), highlighting quotes that entailed advisors' and advisees' overall experiences and challenges encountered in academic advising. Next, I conducted axial coding (Esterberg, 2002) to develop clusters of meaning from the individual codes into thematic categories. Finally, I evaluated all the themes and subthemes and described findings, revealing challenges in advising engineering transfer students with supporting quotes from transfers and faculty advisors.

Trustworthiness

To ensure trustworthiness, I examined my preconceptions regarding academic advising in engineering programs before and throughout data collection and analysis. As a faculty member and researcher in education, I have not been employed in COE, but I conducted interviews with staff and faculty advisors and talked with engineering students in engineering programs for other research projects. I examined my experiences working with engineering students and advisors, identified areas of potential bias, and employed bracketing to minimize its influences (Ahern, 1999). I also used data from advisors and advisees to provide corroborating evidence about challenges in advising engineering transfer students in a 4-year context (Lincoln & Guba, 1985; Yin, 2014). I conducted member-checking by confirming a summary of themes and subthemes with the participants. None of the students responded with questions, but two advisors asked for clarification about the organization of the themes. Their comments helped me

improve the description and interpretation of the findings. Additionally, I debriefed with a graduate research assistant, who conducted five of the nine student interviews; met with a COE faculty advisor, who did not participate in the study but provided in-depth information regarding the context throughout the study; and consulted with an experienced qualitative researcher regarding the data analysis process, emergent findings, and the final themes. Overall, these strategies allowed me to view the data from different perspectives and added depth to my analysis of the phenomenon of advising engineering transfer students.

Limitations

To support the transferability of the findings, I acknowledge the following limitations of the study. First, although together they provided a comprehensive understanding of advising practice with engineering transfers, the transfer students and faculty advisors were not paired. Consequently, the advisors were not aware of specific incidents reported by some participants and were unable to respond directly to these incidents. Second, the majority of the advisees and advisors in this study were male. Although it reflected the percentages of male students and faculty advisors in the COE, we should not take it for granted that the study findings represent "general" engineering programs without considering females' voices and experiences. Finally, I only studied faculty advisors and purposefully excluded staff advisors as they primarily worked with nontransfer freshmen advisees in the COE. However, other institutions may offer different advising models in which staff advisors play a major role in advising transfer students.

Findings

The study findings indicated that academic advising practices were shaped jointly by the experiences of transfer students and academic advisors. They were also impacted significantly by the structure and requirements of engineering programs at the university.

Challenges for Transfer Students

The interviews revealed that engineering transfer students in this study experienced difficulties, including inadequate preparation for rigorous engineering courses at the university and struggles to maintain a healthy balance between

academic and nonacademic responsibilities. Unfortunately, faculty advisors could not provide rapid or easy solutions for transfers who were unprepared for the engineering coursework or struggled to find time to complete assignments. Both transfer students and faculty advisors faced significant obstacles in trying to find ways to resolve these issues.

Academic Unpreparedness

Most transfer participants did not feel prepared for the university engineering programs. Many reported that their academic study in community colleges was less rigorous than at the university. Carlos described his community college courses as "mundane high school courses," confessing disengagement in these "boring" courses. In terms of mathematics, many transfers felt underprepared and experienced a shock upon transferring. Taking three math courses with a community college professor who neither used books nor gave any homework, Clair was overly concerned about her math preparation, "I am not even sure if I learned everything I was supposed to or if what we covered really had to do with that class."

All transfer participants noted that their academic workload at the university was much more intense than it was at the community college. These transfers had to devote more effort to stay on top of the heavy workload and spend extra time on homework, projects, and test preparation. Harris talked about his experiences in both institutions,

When I was in the community college ... for the whole semester just one assignment, but here [at the university] ... more assignments, big huge assignments like go to the places or you need to do it with your hands, or sometimes you're not done with the first one and then you get the second one.

In particular, participants who transferred with many foundation courses expressed high exhaustion as nearly all courses they took at the university were upper division. "I've spent endless hours just rereading the chapters and re-writing my notes and re-watching video lectures and just working through problems primarily to try to make it through," Luis commented when describing his first semester. Likewise, taking four advanced engineering courses including a foundation one

in her first semester, Clair felt she was "being thrown off a boat, and everybody is just drowning together."

The faculty advisors' responses confirmed the transfers' experiences and expressed concerns that transfer students were not adequately prepared for the rigor and intensity of the engineering programs at the university. "They may not learn what they were supposed to learn at the community college," reported Dr. Hill. The lack of preparation was especially troubling for mathematics courses, which are key precursors of engineering students' persistence and success. The advisors perceived mathematics as an essential component in academic. Many transfer advisees were not calculus-ready, which diminished the advisors' confidence in providing sufficient resources and solutions to assist the transfers.

Struggles with Nonacademic Responsibilities

In addition to academic challenges, the transfer participants struggled with responsibilities outside the classroom. Job and family obligations made it difficult for transfers to balance personal life, career, and academic study. All transfer students in the study chose to live off-campus for lower living costs, family responsibilities, or shorter work commutes. However, the transfers acknowledged that this choice significantly limited their participation in college activities and connection with peers. It also constrained their access to on-campus services and support, such as meeting with advisors. Although they knew that being a full-time student would greatly benefit their learning, they had to, as Teo stated, "work to make ends meet."

The advisors were fully aware of the challenges shared by the transfer students. According to the advisors interviewed, full-time employment and off-campus housing restricted transfers' opportunity to gain full benefit from on-campus academic services. Dr. Anderson said transfer students had to "give up a lot of their time" commuting and consequently sacrificed sleep or social events for academic study. In addition, Dr. Newman observed that many transfer students struggled with the course and lab work because they could not invest as much time in academic studies as their nontransfer peers who lived on campus. Some faculty advisors felt there was little they could do to change this situation and were apprehensive when advising transfer students. The advisors offered practical advice for transfers to

overcome the challenges, such as using tutoring services, forming learning groups, and discussing questions with faculty members outside class, but their advice was not well received by transfer students. For instance, Dr. Anderson believed advisors “know what advice to offer,” but “the students don’t always have the time to follow through with the suggestions.”

Overall, the engineering transfer students interviewed experienced many challenges that hindered their adjustment to engineering programs at the university and prevented them from taking full advantage of advising services. These challenges were primarily attributed to students’ inadequate academic preparation and competing work and family responsibilities.

Challenges for Academic Advisors

This theme highlighted the challenges that academic advisors encounter in effectively advising engineering transfer students. It contains three subthemes: heavy workload, disconnection with other student services, and lack of communication with community college academic advisors.

Heavy Workload

The faculty advisors repeatedly reported difficulty allocating time to advise students. Dr. Gilbert referred to the struggle between advising and other faculty responsibilities, such as research and teaching, as a “battle” that every faculty advisor was fighting:

There’s no way an advising tenure track faculty member is going to give up research time to advise students. It just isn’t going to work. At that same time, they load non-tenure-track lecturers down with so many classes to teach that they can’t focus on advising either.

Dr. Wilson concurred and posited that involvement in advising pushed faculty away from research and teaching. Although he felt it was “a real shame” when faculty members could not afford the time to advise students, Dr. Wilson, as a full professor, struggled to maintain a healthy balance between teaching, guiding senior projects, and advising approximately 200 students.

Transfer participants sensed the time constraints and reported that faculty advisors at the university were not as accessible as advisors or

instructors in the community college. Many transfers in this study reported difficulty contacting their advisors. Consequently, transfers relied on themselves or peers for guidance and support. Frank usually Googled the information first and then checked with other transfer students when he had questions about course selection or academic planning. He would only make an appointment with his advisor when his questions remained unsolved. Frank explained that he chose not to contact the advisors because, “You have to wait for a couple of days or sometimes a week to find the next available slot to meet with your advisor.”

Disconnection with Other Student Services

According to the faculty advisors, effective advising requires not only knowledge of specific engineering disciplines but also information related to other aspects of transfer students’ success at the university, including knowledge about taking courses outside of the major, acceptance of community college credits, and application for financial aid. However, many advisors experienced isolation from other student support services on campus. Dr. Marshall felt it was “disheartening” to hear nothing back from other institutional personnel when requesting additional information for her transfer advisees. Dr. Roberts expressed her frustration about the lack of collaboration with other personnel within the university:

When I know nothing about financial aid, when I can’t get anyone on the phone; what I don’t know, things about the admission, things about records, why the transfer credits you sent in are not showing up in the system, all those kinds of things. There is not an easy way to even track all of that down.

The faculty advisors in this study felt incapable of fully supporting engineering transfer students in academic advising because of their lack of knowledge about how other offices work with transfers. Some were concerned about students’ satisfaction when they had to go to other offices for a solution. Dr. Wilson directed students to other offices to acquire additional information, but he acknowledged that it could potentially lead to frustration among the students.

Interviews with the transfer students echoed the advisors’ concerns. Teo had to visit the admissions

office several times to find out why a prerequisite course he took at the community college was not recognized. The problem was eventually solved, but Teo enrolled late in all core engineering courses in his first semester.

Lack of Communication with Community College Academic Advisors

The advisors and students interviewed noticed a lack of communication between faculty advisors at the university and their counterparts in community colleges. Dr. Wilson noted, “the community colleges are often advising the students [who plan to transfer] to get their associate degree, which is not a requirement at all for what we do.” In addition, some transfer participants were advised to take courses at community colleges that could not be transferred to the engineering degree programs at the university. Under these circumstances, Dr. Roberts was concerned that inconsistent or conflicting advice could increase transfer students’ anxiety and make their adjustment even more challenging.

Reflecting on their pretransfer experiences, several students reported scenarios where they received inadequate or misleading information because of the lack of communication between advisors at the 4-year university and community colleges. Carlos took a couple of courses that were recommended by his community college advisor, but he had to retake them at the university. While navigating his transfer courses, Harris realized that “there was no communication” between advisors at the community college and the university. He said the process of being sent back and forth between offices was “hard on the students” because students “don’t know what’s going on.” To clarify questions related to program requirements in engineering, Teo and several other students chose to visit the university advisors before transferring.

In summary, faculty advisors found it challenging to dedicate themselves to advising, given their heavy workload of advising, teaching, and research. They also felt siloed, as they received little support from other university personnel and had insufficient communication with community college advisors. These challenges aggravated students’ anxiety and stress, leading them to seek guidance on their own or from other transfer students. Consequently, academic advising was not practiced at its full potential to serve the transfer students.

Restrictions on Course Selection and Program Requirements

The study found that transfer students who used community colleges as stepping stones to obtain an engineering degree experienced more challenges in selecting courses to fulfill their degree plans at the university. As consistently reported by advisors, engineering programs at the university were not designed to serve transfer students. Many advisors experienced difficulties selecting appropriate courses to follow the required sequence without overburdening transfer students. Dr. Gilbert stressed that it was very difficult to find classes transfer students could take to maintain their full-time student status while following a strict linear course sequence. The limited course offerings made course selection even more challenging. Larry reported that he needed a prerequisite course in the first semester at the university, but he still had not been able to take it in the second semester.

Transferring credits earned at community colleges, in theory, enabled transfer students to shorten their time to degree obtainment. However, the interviews suggest otherwise. Several transfer participants had to retake courses completed at community colleges because they could not demonstrate mastery and understanding of the course material, which resulted in extending their time in college. As Dr. Marshall explained, it might enhance transfer students’ preparedness, but retaking courses could delay graduation if requirements are not clearly communicated before transfer. For instance, Clair had to retake two courses to demonstrate her mastery of the content:

Now looking back, I was happy that I retook these courses, because they were important for the more advanced courses.... I had a good review of those courses. But I wish I had known about this ahead of time. I planned to graduate in two years, so it caught me off guard when I learned I had to stay for one more semester.

Discussion and Implications

By providing a dual perspective of academic advising from engineering transfer students and faculty advisors, this study offered a fuller understanding of the challenges they encounter. The following explores the findings and provides

implications for policy and practice for advising engineering transfer students at 4-year universities.

Enhancing Transfer Students' Academic Preparedness

The study findings suggest that engineering transfer students may not be academically prepared, especially in mathematics, for 4-year engineering programs. This finding echoed previous research emphasizing the significance of mathematics for transfer to 4-year institutions and success in engineering disciplines (Bahr et al., 2017; Cohen & Kelly, 2019; Laugerman et al., 2015; Tyson, 2011). Early research also provided evidence that students' feeling of unpreparedness for rigorous engineering programs could lead to engineering attrition (Koenig et al., 2012; Meyer & Marx, 2014). Therefore, it is critical to improve transfer students' academic preparation to ensure a successful transition to and persistence in 4-year engineering programs.

An important strategy to improve transfers' preparedness is to maximize their learning opportunities in community colleges. While academic preparation in high school is important for transfers, learning in community colleges is even more important because it serves as the last stepping stone to 4-year engineering degrees. Some transfers did not choose to pursue an engineering degree until they attended community colleges (Allen & Zhang, 2016). To improve students' preparation, community colleges could engage pre-transfer students in transfer-oriented, lower-division courses with more rigor and robust academic support. Particularly for math preparation, mathematics faculty members in community colleges could team up with faculty members at 4-year universities to develop foundation math courses better aligned with the university requirements.

Alleviating Transfer Students' Nonacademic Challenges

The findings of the study suggest that transfer students struggle to balance academic studies with other responsibilities. This echoed previous research on transfer students' adjustment (e.g., Berger & Malaney, 2003; Gard et al., 2012; Ishitani & McKittrick, 2010) and reinforced that engineering transfer students undergo many challenges upon transferring to a 4-year university. Consequently, transfer students did not view academic advising as a priority nor did they use this vital service to its full capacity.

To respond to this challenge, 4-year universities could consider providing engineering transfer students with more financial aid opportunities, such as grants, scholarships, and work-study programs. They could also provide academic support that better accommodates transfers' working schedules and needs. Transfers, especially those from low socio-economic backgrounds, tend to be employed part- or full-time to support their academic pursuits. Students with employment may devote less time to school work, leading to a departure from college (Bozick, 2007). Similarly, Sullivan et al. (2012) found that part-time engineering students, regardless of their transfer status, underperformed in engineering and overall academic studies compared to their full-time peers. With additional financial support from the receiving 4-year universities, engineering transfers could spend more time on academic studies by reducing employment. Additionally, educational programs offered outside regular business hours or with more flexible schedules could encourage transfers to engage in academic work. Offering financial and academic support that caters to transfer students' needs contributes to a transfer-receptive culture (Jain et al., 2016). Consequently, the engineering transfers would be more likely to take full advantage of academic advising and have a higher chance of obtaining an engineering degree.

Support for Faculty Advisors' Engagement in Advising Transfers

This study suggests that faculty advisors' heavy workloads restrict them from being fully dedicated to advising engineering transfer students. This finding is consistent with previous research that faculty at 4-year universities were less accessible and less likely than instructors in community colleges to connect with transfer students (Bauer & Bauer, 1994; Davies & Dickmann, 1998). To strengthen the connection between students and faculty advisors, 4-year universities may consider installing an institution wide mechanism to fully acknowledge the faculty advisors for their time and effort in academic advising. In so doing, faculty advisors may be more willing to dedicate their full attention to the needs of the transfer students and develop a positive advisor-advisee relationship, which lays a foundation for building a more satisfying advising experience for transfer students.

Effective academic advising does not happen in isolation but requires the support of the entire

campus. However, the study findings suggest a lack of support from other professionals and offices when academic advisors seek help to assist their transfer advisees. Academic advisors are responsible for developing goals for students and helping them overcome individual and institutional barriers they may encounter to accomplish their goals (Varma & Hahn, 2007). Therefore, academic advisors must constantly work with others on campus to achieve students' goals. Otherwise, the role of academic advisors in responding to transfer students' needs could be significantly compromised. To strengthen such collaboration, 4-year universities could create in-person and virtual opportunities in formal and informal settings for academic advisors to get to know their peers in the student affairs division and learn from their expertise in serving transfer students.

Another strategy to enhance academic advising for engineering transfer students is to strengthen communications between advisors in 2- and 4-year institutions. For instance, community colleges and their 4-year partners could utilize e-portfolios to facilitate their collaboration, through which transfer students can access advisors in both institutions before, during, and after the transfer (Allen et al., 2014). Additionally, advisors in community colleges could better understand transfer students' goals and plans, and advisors at 4-year universities could gain more knowledge about the history of transfer students' academic trajectory and their pretransfer experiences with academic advising (Allen et al., 2014).

Redesigning Engineering Programs at 4-year Universities

As shown in the findings, the engineering programs at the university are not designed to serve community college transfers, and the restrictions imposed on these students have created tension between advisors and advisees. One of the major restrictions was the limited course offerings. To respond to this challenge, 4-year universities could offer additional sessions on evenings or weekends, with extended hours for academic advising services. Similarly, in Gard et al.'s (2012) study, transfer students recommended that 4-year degree programs provide more flexibility in course scheduling to better accommodate the schedules of students with full-time employment.

Another important restriction was that many transfer students were required to retake courses

transferred from community colleges. Although it may enhance transfers' academic preparation for upper-level courses, this approach could significantly delay their planned graduation and place a heavier financial burden on them and their families. Community colleges and 4-year universities have collaborated to forge articulation agreements since the late 1980s (Allen et al., 2014); however, these agreements are often broad and do not apply to specific disciplines (Hodara et al., 2017). To eliminate unnecessary course retaking, 4-year universities could develop major-specific articulation agreements with community college partners to strengthen the alignment of the engineering curriculum and set forth agreed-upon learning objectives for each course. Collaboration among 4-year advisors and community college counterparts could also ensure that students receive the most up-to-date information at the course level and avoid direction given to take courses that do not contribute to 4-year engineering degrees.

Conclusion

Taking a qualitative phenomenological approach, I explored lived experiences of engineering transfer students and faculty advisors at a 4-year public research university. The study findings shed light on the challenges faced by engineering transfers and faculty advisors and provided implications for policy and practice concerning academic advising. Community colleges serve as critical pathways for transfer students to pursue engineering degrees, but access only is not sufficient. Both community colleges and 4-year universities need to develop policies and practices that promote transfer students' success in engineering. Such efforts could lead to higher persistence and degree attainment rates for community college transfers pursuing engineering degrees, and this line of inquiry warrants further exploration and extension.

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Authors' Notes

I appreciate the feedback that I received from the reviewers and editors. I am also thankful for the support provided by the National Science Foundation.

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Appendix A. Interview Protocols

Interview questions for engineering transfers

1. How would you describe your typical day at the university?
2. Please tell me about your personal, educational, and professional background.
 - What is your current major? And have you changed your major?
 - How many hours do you usually work on and/or off campus?
 - When did you transfer to the university?
 - Where did you study prior to the university?
3. Please describe your experience working with academic and/or faculty advisors at the community college.
 - How often did you meet with an advisor?
 - Why did you go to visit an advisor?
 - Overall, were you satisfied with your experience meeting with the advisor(s)?
4. Please describe your experience working with faculty advisors at the university.
 - How often do you meet with an advisor?
 - Why did you go to visit an advisor?
 - Overall, are you satisfied with your experience meeting with the advisor(s)?
5. What went well regarding working with your advisor at the university? And what challenges have you encountered, if any?
6. What could the university do to further improve transfers' experience and engagement in academic advising?
7. Are there any other thoughts you would like to share with me?

Interview questions for faculty advisors

1. How would you describe your typical day at the university?
2. Please tell me about your personal, educational, and professional background.
3. What are your primary responsibilities as a faculty advisor?
 - How long have you served as a faculty advisor?
 - How many students do you typically advise?
4. Please describe your experiences advising transfer students in your program.
5. What went well regarding advising transfer students? What challenges have you encountered, if any?
6. What could the university do to further improve transfer students' experience and engagement in academic advising?
7. Are there any other thoughts you would like to share with me?